

REMARKS

Summary

Claims 1-6, 10-12, 14- 16 and 18 are pending in this application. Claim 13 has been cancelled. Claims 1, 11-12, 15 and 18 have been amended. Support for the above amendments can be found in the specification at least at paragraphs [0049]-[0050].

Favorable reconsideration and allowance of the pending claims are requested.

37 C.F.R. 1.131 Declaration

The declaration filed on 6/24/2009 under 37 CFR 1.131 was rejected as being silent regarding where the prior invention was established.

The prior invention was established in the United States, a NAFTA country or a WTO member country. Evidence of this is seen in that all the inventors live and are citizens of the United States, a NAFTA country or a WTO member country. Accordingly, the declaration filed on 6/24/2009 should be effective in overcoming the Sun et al. reference.

Claim Rejections - 35 U.S.C. § 103

Claims 1-3, 10-12 and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Publication No. 2005/0152314 to Sun et al. (hereinafter "Sun") in view of International Publication No. WO 2001/37474 to Andre (hereinafter "Andre") further in view of International Publication No. WO 2003/071712 to Ebiko et al. (hereinafter "Ebiko"). Applicants respectfully traverse the rejection, and requests reconsideration and withdrawal of the rejection.

According to MPEP § 2143, three basic criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be

found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP 706.02(j).

Applicant submits that the cited references, taken alone or in combination, fail to teach each and every element recited in claims 1-3, 10-12 and 14 and thus they define over the cited references. For example, with respect to claim 1, the cited references fail to teach at least the following language:

an adaptive equalizer to equalize a received multicarrier symbol based on the averaged channel estimate, the adaptive equalizer including a mapping block to generate a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers

According to the Office Action, the above-recited language is disclosed by the Ebiko at Abstract and Figure 1. This assertion is respectfully traversed.

Applicant respectfully submits that claim 1 defines over Ebiko because the Ebiko fails to disclose, teach or suggest at least the adaptive equalizer including a mapping block to generate a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers. As provided for in the Specification, the replica of a transmitted multicarrier symbol provides a significant technical advantage because it is used to "generate updated channel estimates to equalizer 230."

As stated in the Office Action, Sun and Andre do not teach generation of a replica of the transmitted symbol. Additionally, Sun and Andre do not teach that the adaptive equalizer includes a mapping block. Furthermore, Sun and Andre do not teach any type of replica. Accordingly, Sun and Andre do not teach the adaptive equalizer including a mapping block to generate a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers, as recited in claim 1.

Ebiko does not overcome the deficiencies of Sun and Andre. Ebiko teaches that an "equalizer generates a replica of the received signal and performs equalization and eliminates a delayed wave component from the received signal." Ebiko at Abstract. Ebiko does not teach that the replica is of a transmitted multicarrier symbol for each of a plurality of subcarriers. Ebiko merely teaches receiving a radio signal. Nowhere does Ebiko teach that the replica is a multicarrier symbol. Furthermore, Ebiko does not teach

a mapping block to generate a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers. Accordingly, Ebiko does not teach “an adaptive equalizer to equalize a received multicarrier symbol based on the averaged channel estimate, the adaptive equalizer including a mapping block to generate a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers.” Consequently, the cited references, whether taken alone or in combination, fail to disclose, teach or suggest every element recited in claim 1.

Absence from the cited references of the above-mentioned claim elements negates obviousness. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claims 1. Furthermore, Applicant respectfully requests withdrawal of the obviousness rejection with respect to claims 2-3 and 10, which depend from claim 1, and therefore contain additional features that further distinguish these claims from the cited references.

Independent claim 11 recites elements similar to those recited in claim 1. Therefore, Applicant respectfully submits that claim 11 is not obvious and is patentable over the cited references for reasons analogous to those presented with respect to claim 1. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claim 11. Furthermore, Applicant respectfully requests withdrawal of the obviousness rejection with respect to claims 12 and 14 that depend from claim 11, and therefore contain additional features that further distinguish these claims from the cited references.

Claim 4

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Publication No. 2005/0152314 to Sun et al. (hereinafter “Sun”) in view of International Publication No. WO 2001/37474 to Andre (hereinafter “Andre”) further in view of International Publication No. WO 2003/071712 to Ebiko et al. (hereinafter “Ebiko”) further in view of United States Publication No. 2004/0125235 to Kim et al. (hereinafter “Kim”). Applicants respectfully traverse the rejection, and requests reconsideration and withdrawal of the rejection.

As recited above, Applicant respectfully submits that Sun, Andre and Ebiko fail to disclose each and every element recited in independent claim 1. Moreover, Applicant respectfully submits that Kim fails to remedy the above identified deficiencies of Sun, Andre and Ebiko. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claim 4 that depends from claim 1, and therefore contains additional features that further distinguish these claims from the cited references.

Claim 5

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Publication No. 2005/0152314 to Sun et al. (hereinafter “Sun”) in view of International Publication No. WO 2001/37474 to Andre (hereinafter “Andre”) further in view of International Publication No. WO 2003/071712 to Ebiko et al. (hereinafter “Ebiko”) further in view of United States Publication No. 2004/0142665 to Papathanasion (hereinafter “Papathanasion”). Applicants respectfully traverse the rejection, and requests reconsideration and withdrawal of the rejection.

As recited above, Applicant respectfully submits that Sun, Andre and Ebiko fail to disclose each and every element recited in independent claim 1. Moreover, Applicant respectfully submits that Papathanasion fails to remedy the above identified deficiencies of Sun, Andre and Ebiko. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claim 5 that depends from claim 1, and therefore contains additional features that further distinguish these claims from the cited references.

Claim 6

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Publication No. 2005/0152314 to Sun et al. (hereinafter “Sun”) in view of International Publication No. WO 2001/37474 to Andre (hereinafter “Andre”) further in view of International Publication No. WO 2003/071712 to Ebiko et al. (hereinafter “Ebiko”) further in view of United States Patent No. 6,757,272 to Abeta et al. (hereinafter “Abeta”). Applicants respectfully traverse the rejection, and requests reconsideration and withdrawal of the rejection.

As recited above, Applicant respectfully submits that Sun, Andre and Ebiko fail to disclose each and every element recited in independent claim 1. Moreover, Applicant respectfully submits that Abeta fails to remedy the above identified deficiencies of Sun, Andre and Ebiko. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claim 6 that depends from claim 1, and therefore contains additional features that further distinguish these claims from the cited references.

Claims 15, 16 and 18

Claims 15, 16 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Publication No. 2005/0152314 to Sun et al. (hereinafter “Sun”) in view of International Publication No. WO 2001/37474 to Andre (hereinafter “Andre”) further in view of International Publication No. WO 2003/071712 to Ebiko et al. (hereinafter “Ebiko”) further in view of United States Publication No. 2004/0125235 to Kim et al. (hereinafter “Kim”). Applicants respectfully traverse the rejection, and requests reconsideration and withdrawal of the rejection.

Applicant submits that the cited references, taken alone or in combination, fail to teach each and every element recited in claims 15, 16 and 18 and thus they define over the cited references. For example, with respect to claim 15, the cited references fail to teach at least the following language:

generating a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers

According to the Office Action, the above-recited language is disclosed by the Ebiko at Abstract and Figure 1. This assertion is respectfully traversed.

Applicant respectfully submits that claim 1 defines over Ebiko because the Ebiko fails to disclose, teach or suggest at least generating a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers. As provided for in the Specification, the replica of a transmitted multicarrier symbol provides a significant technical advantage because it is used to “generate updated channel estimates to equalizer 230.”

As stated in the Office Action, Sun and Andre do not teach generation of a replica of the transmitted symbol. Furthermore, Sun and Andre do not teach any type of replica. Accordingly, Sun and Andre do not teach generating a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers, as recited in claim 15.

Ebiko does not overcome the deficiencies of Sun and Andre. Ebiko teaches that an “equalizer generates a replica of the received signal and performs equalization and eliminates a delayed wave component from the received signal.” Ebiko at Abstract. Ebiko does not teach that the replica is of a transmitted multicarrier symbol for each of a plurality of subcarriers. Ebiko merely teaches receiving a radio signal. Nowhere does Ebiko teach that the replica is a multicarrier symbol. Accordingly, Ebiko does not teach “generating a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers,” as recited in claim 15. Consequently, the cited references, whether taken alone or in combination, fail to disclose, teach or suggest every element recited in claim 15.

Moreover, Applicant respectfully submits that Kim fails to remedy the above identified deficiencies of Sun, Andre and Ebiko. Kim teaches an equalizer which comprises “a channel estimator, a channel distortion compensator and noise canceller.” Kim at Abstract. Kim further teaches that “the channel distortion compensator transforms and processes the received signal and the estimated impulse response.” *Id.* However, Kim does not teach “generating a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers.” Consequently, the cited references, whether taken alone or in combination, fail to disclose, teach or suggest every element recited in claim 15.

Absence from the cited references of the above-mentioned claim elements negates obviousness. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claims 15. Furthermore, Applicant respectfully requests withdrawal of the obviousness rejection with respect to claim 16, which depends from claim 15, and therefore contains additional features that further distinguish these claims from the cited references.

Independent claim 18 recites elements similar to those recited in claim 15. Therefore, Applicant respectfully submits that claim 18 is not obvious and is patentable over the cited references for reasons analogous to those presented with respect to claim 15. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claim 18.

Claims 1-4, 10-12 and 14

Claims 1-4, 10-12 and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Publication No. 2002/0181390 to Mody et al. (hereinafter “Mody”) in view of International Publication No. WO 2003/071712 to Ebiko et al. (hereinafter “Ebiko”). Applicants respectfully traverse the rejection, and requests reconsideration and withdrawal of the rejection.

According to MPEP § 2143, three basic criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP 706.02(j).

Applicant submits that the cited references, taken alone or in combination, fail to teach each and every element recited in claims 1-4, 10-12 and 14 and thus they define over the cited references. For example, with respect to claim 1, the cited references fail to teach at least the following language:

an adaptive equalizer to equalize a received multicarrier symbol based on the averaged channel estimate, the adaptive equalizer including a mapping block to generate a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers; and

According to the Office Action, the above-recited language is disclosed by the Ebiko at Abstract and Figure 1. This assertion is respectfully traversed.

Applicant respectfully submits that claim 1 defines over Ebiko because the Ebiko fails to disclose, teach or suggest at least the adaptive equalizer including a mapping block to generate a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers. As provided for in the Specification, the replica of a transmitted multicarrier symbol provides a significant technical advantage because it is used to “generate updated channel estimates to equalizer 230.”

As stated in the Office Action, Mody does not teach generation of a replica of the transmitted symbol. Additionally, Mody does not teach that the adaptive equalizer includes a mapping block. Furthermore, Mody does not teach any type of replica. Accordingly, Mody does not teach the adaptive equalizer including a mapping block to generate a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers, as recited in claim 1.

Ebiko does not overcome the deficiencies of Mody. Ebiko teaches that an “equalizer generates a replica of the received signal and performs equalization and eliminates a delayed wave component from the received signal.” Ebiko at Abstract. Ebiko does not teach that the replica is of a transmitted multicarrier symbol for each of a plurality of subcarriers. Ebiko merely teaches receiving a radio signal. Nowhere does Ebiko teach that the replica is a multicarrier symbol. Furthermore, Ebiko does not teach a mapping block to generate a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers. Accordingly, Ebiko does not teach “an adaptive equalizer to equalize a received multicarrier symbol based on the averaged channel estimate, the adaptive equalizer including a mapping block to generate a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers.” Consequently, the cited references, whether taken alone or in combination, fail to disclose, teach or suggest every element recited in claim 1.

Absence from the cited references of the above-mentioned claim elements negates obviousness. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claims 1. Furthermore, Applicant respectfully requests withdrawal of the obviousness rejection with respect to claims 2-4 and 10, which depend from claim 1, and therefore contain additional features that further distinguish these claims from the cited references.

Independent claim 11 recites elements similar to those recited in claim 1. Therefore, Applicant respectfully submits that claim 11 is not obvious and is patentable over the cited references for reasons analogous to those presented with respect to claim 1. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claim 11. Furthermore, Applicant respectfully requests withdrawal of the obviousness rejection with respect to claims 12, 14 that depend from claim 11, and therefore contain additional features that further distinguish these claims from the cited references.

Claim 5

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Publication No. 2002/0181390 to Mody et al. (hereinafter "Mody") in view of International Publication No. WO 2003/071712 to Ebiko et al. (hereinafter "Ebiko") further in view of United States Publication No. 2004/0142665 to Papathanasion (hereinafter "Papathanasion"). Applicants respectfully traverse the rejection, and requests reconsideration and withdrawal of the rejection.

As recited above, Applicant respectfully submits that Mody fails to disclose each and every element recited in independent claim 1. Moreover, Applicant respectfully submits that Papathanasion fails to remedy the above identified deficiencies of Mody and Ebiko. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claim 5 that depends from claim 1, and therefore contains additional features that further distinguish these claims from the cited references.

Claim 6

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Publication No. 2002/0181390 to Mody et al. (hereinafter “Mody”) in view of International Publication No. WO 2003/071712 to Ebiko et al. (hereinafter “Ebiko”) further in view of United States Patent No. 6,757,272 to Abeta et al. (hereinafter “Abeta”). Applicants respectfully traverse the rejection, and requests reconsideration and withdrawal of the rejection.

As recited above, Applicant respectfully submits that Mody and Ebiko fail to disclose each and every element recited in independent claim 1. Moreover, Applicant respectfully submits that Abeta fails to remedy the above identified deficiencies of Mody and Ebiko. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claim 6 that depends from claim 1, and therefore contains additional features that further distinguish these claims from the cited references.

Claims 15, 16 and 18

Claims 15, 16 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Publication No. 2002/0181390 to Mody et al. (hereinafter “Mody”) in view of International Publication No. WO 2003/071712 to Ebiko et al. (hereinafter “Ebiko”). Applicants respectfully traverse the rejection, and requests reconsideration and withdrawal of the rejection.

Applicant submits that the cited references, taken alone or in combination, fail to teach each and every element recited in claims 15, 16 and 18 and thus they define over the cited references. For example, with respect to claim 15, the cited references fail to teach at least the following language:

generating a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers

According to the Office Action, the above-recited language is disclosed by the Ebiko at Abstract and Figure 1. This assertion is respectfully traversed.

Applicant respectfully submits that claim 1 defines over Ebiko because the Ebiko fails to disclose, teach or suggest at least generating a replica of a transmitted multicarrier

symbol for each of a plurality of subcarriers. As provided for in the Specification, the replica of a transmitted multicarrier symbol provides a significant technical advantage because it is used to “generate updated channel estimates to equalizer 230.”

As stated in the Office Action, Mody does not teach generation of a replica of the transmitted symbol. Additionally, Mody does not teach any type of replica. Accordingly, Mody does not teach generating a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers, as recited in claim 15.

Ebiko does not overcome the deficiencies of Mody. Ebiko teaches that an “equalizer generates a replica of the received signal and performs equalization and eliminates a delayed wave component from the received signal.” Ebiko at Abstract. Ebiko does not teach that the replica is of a transmitted multicarrier symbol for each of a plurality of subcarriers. Ebiko merely teaches receiving a radio signal. Nowhere does Ebiko teach that the replica is a multicarrier symbol. Accordingly, Ebiko does not teach “generating a replica of a transmitted multicarrier symbol for each of a plurality of subcarriers,” as recited in claim 15. Consequently, the cited references, whether taken alone or in combination, fail to disclose, teach or suggest every element recited in claim 15.

Absence from the cited references of the above-mentioned claim elements negates obviousness. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claims 15. Furthermore, Applicant respectfully requests withdrawal of the obviousness rejection with respect to claim 16, which depends from claim 15, and therefore contains additional features that further distinguish these claims from the cited references.

Independent claim 18 recites elements similar to those recited in claim 15. Therefore, Applicant respectfully submits that claim 18 is not obvious and is patentable over the cited references for reasons analogous to those presented with respect to claim 15. Accordingly, Applicant respectfully requests removal of the obviousness rejection with respect to claim 18.

Conclusion

It is believed that claims 1-6, 10-12, 14-16 and 18 are in condition for allowance. Accordingly, a timely Notice of Allowance to this effect is earnestly solicited.

Applicants do not otherwise concede, however, the correctness of the Office Action's rejection with respect to any of the limitations of the independent claims and dependent claims discussed above. Accordingly, Applicants hereby reserve the right to make additional arguments as may be necessary to further distinguish the claims from the cited references, taken alone or in combination, based on additional features contained in the independent or dependent claims that were not discussed above. A detailed discussion of these differences is believed to be unnecessary at this time in view of the basic differences in the independent claims pointed out above.

The Examiner is invited to contact the undersigned to discuss any matter concerning this application.

The Office is hereby authorized to charge any additional fees or credit any overpayments under 37 C.F.R. § 1.16 or § 1.17 to the Deposit Account No. 50-4238.

Respectfully submitted,

KACVINSKY LLC

/Rebecca M. Bachner/

Rebecca M. Bachner, Reg. No. 54,865
Under 37 CFR 1.34(a)

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